

COMPENSATING CONTROLLER WITH PRODUCTION DHW

C ←RING

RTE 643 Eng. C2



- **Digital controller for boiler plant**
 - compensated control of heating zone
 - On-Off control of auxiliary circuit (DHW) or timed On-Off control
- **Communication systems :**
 - C-Ring for sharing data between local controllers
- **Power supply 230 V~ ; DIN rail mounting**

1. APPLICATION

RTE 643 controller is designed for winter compensated control of central heating plants in, for example :

- administrative and commercial buildings
- schools
- residential complexes

2. FUNCTIONS

The principal functions of RTE 643 are:

- **Compensated control of heating zone**
 - three-wire control of valve or On-Off control in one or two stages
 - control of plant pump according current programme of event times with switching off delay
 - ambient frost protection
 - minimum and maximum limits of flow temperature
 - adjustment of heating curve origin
 - self-adapting heating curve in relation to ambient authority
 - Eco Off function
- **Control of auxiliary circuit (DHW) temperature :**
 - control DHW pump by detector or only according timed programme
 - DHW priority function, anticondensing and antibacteria
- **Timed 24-hour or 7-day programming**
- **Automatic switching GMT/BST**
- **Remote control for modifying current programme**

3. DETECTORS, REMOTE CONTROL & ACCESSORIES

No.	Description	Type	Sensing t° element	Code	Data sheet
1	Heating flow temperature detector contact ¹⁾	SCH 010	NTC 10 kΩ	B1	N 130
1	Outside temperature detector	SAE 001	NTC 1kΩ	B2	N 120
1	DHW temperature detector immersion ²⁾	SIH 010	NTC 10 kΩ	B5	N 140
Accessories :					
1	Ambient temperature detector	SAB 010	NTC 10 kΩ	B3	N 111
1	Boiler anticondensing temp. detector immersion ³⁾	SIH 010	NTC 10 kΩ	B4	N 140
1	Remote control for modifying current programme	CDB 300	–	R	N 710
1	Remote control for modifying current programme with sensor (included)	CDB300/S1	–	R	N 710
Alternatives :					
1	1) Immersion temperature detector	SIH 010	NTC 10 kΩ	B1	N 140
1	2) Cable-type temperature detector	SAF 010	NTC 10 kΩ	B5	N 145
1	3) Cable-type temperature detector	SAF 010	NTC 10 kΩ	B4	N 145

4. TECHNICAL DATA

• Electrical

Power supply	230 V ~ ± 10%
Frequency	50 ... 60 Hz
Consumption	5 VA
Protection	IP40
Radio disturbances	VDE0875/0871
Vibration test	with 2g (DIN 40 046)
Voltage-free output contacts:	
maximum switching voltage	250 V~
maximum switching current	5 (1) A
Construction standards	Italian Electr. Commitee (CEI)
Data storage	5 years

• Mechanical

Case	DIN 6E module
Installation	on DIN 35 rail
Materials:	
base	NYLON
cover	ABS
Ambient temperature:	
operation	0 ... 45°C
storage	- 25 ... + 60°C
Ambient humidity	Class F DIN 40040
Dimensions	105 x 115 x 71,5
Weight	1.0 kg

• Programmes & periods

24-hour programmes	1 ... 7
24-hour events	2 ... 6
7-day programmes :	0 ... 2

• Measurement ranges

Flow temp.	0 ... 99 °C
Outside temp.	- 30 ... + 40 °C
Ambient temp.	0 ... 40 °C
Anticondensing temp.	0 ... 99 °C
DHW temp.	0 ... 99 °C

• Heating

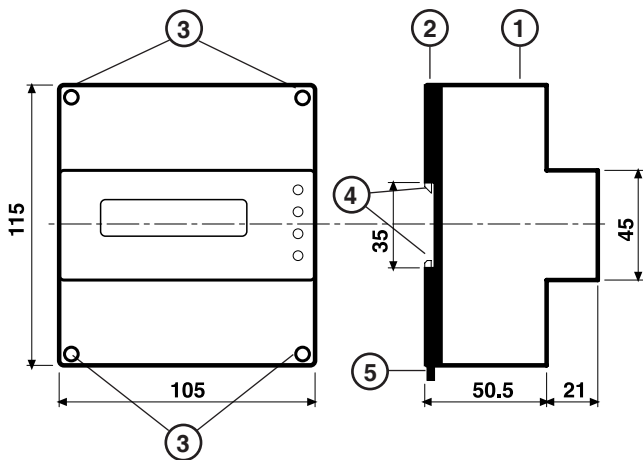
Flow temperature:	
radiators	40 ... 70 ... 99 °C
fan coils	40 ... 80 ... 99 °C
panels	20 ... 40 ... 50 °C
minimum limit	1 ... 99 °C
maximum limit	1 ... 99 °C
Design outside temp.	- 30 ... - 5 ... + 20 °C
Correction curve origin	20 ... 40 °C
Boiler anticondensing temp.	0 ... 50 ... 99 °C
Actuator runtime	30 ... 630 ... 3,600 s
Delay stop pump	2 ... 30 ... 60 minutes
Ambient authority	0 ... 20 °C/°C
Mode temperatures :	
Normal ambient	0 ... 20 ... 30 °C
Setback ambient	0 ... 16 ... 30 °C
Frost protection ambient	0 ... 6.0 ... 30 °C
On-Off differential	1 ... 10 ... 99 °C

• Auxiliary (DHW) control

Temperature	0 ... 50.0 ... 99.0 °C
Differential	0.5 ... 3.0 ... 30.0 °C
Increase C-Ring over desired DHW temp.	0 ... 5.0 ... 50.0 °C

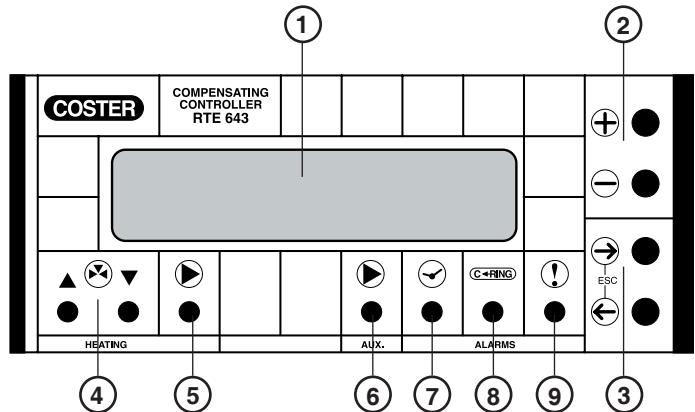
WARNING : In the presence of electrical disturbances the output controls of the controller may change status but this will be restored automatically.

5. OVERALL DIMENSIONS



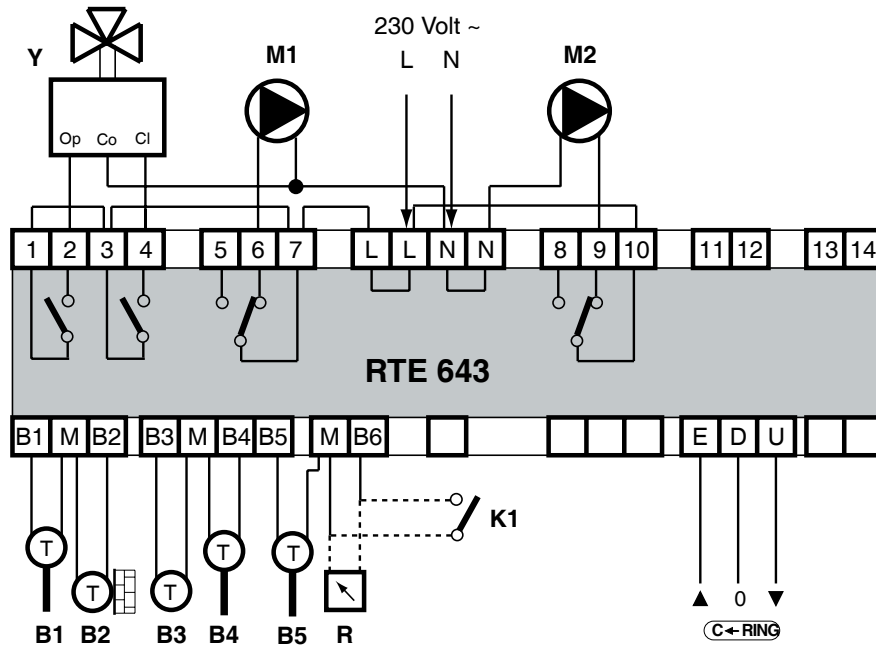
- 1 - Protective cover for electronic components
- 2 - Base with transformer, relay and terminal block
- 3 - Screws for securing cover and base
- 4 - DIN rail securing elements
- 5 - DIN rail release lever

6. FACIA



- 1 - Two-line backlit alphanumeric display
- 2 - + and - operating keys
- 3 - ← and → operating keys
- 4 - Valve control LEDs
- 5 - Plant pump control LED
- 6 - DHW or auxiliary circuit control LED
- 7 - Real time clock alarm LED
- 8 - C-Ring alarm LED
- 9 - Controller fault alarm LED

7. WIRING DIAGRAM



- B1 – Plant flow temp. detector
- B2 – Outside temp. detector
- B3 – Ambient temp. detector
- B4 – Anticondensing temp. detector
- B5 – DHW temp. detector
- K1 – External "REMOTE OFF" switch (as alternative to "R")
- L – Line 230 V ~

- N – Neutral
- M1 – Heating pump
- M2 – Auxiliary circuit pump
- R – Remote control for changing programmes
- Y – Heating motorised valve
- C-Ring – Transmission data between controllers

8. SITING CONTROLLER & DETECTORS

8.1 Controller

The controller must be sited in a dry space which meets the permitted ambiantal conditions shown under 4. Technical Data. If positioned in a space classified as "Dangerous" it must be enclosed in a cabinet for electrical apparatus constructed according to the regulations in force for the class of danger involved. It can be installed on a DIN rail or in a DIN modular enclosure.

8.2 Plant flow temperature detector B1

With plant pump on flow it must be installed downstream of this; with pump on return it must be installed at least 1.5 meters downstream of the regulating valve.

8.3 Outside temperature detector B2

This must be installed outside the building, on the north or north-west side, at least three meters from the ground and protected from direct sunlight, and as far as possible from windows, doors and chimneys.

8.4 Ambient temperature detector B3

This must be installed at a point which represents the average temperature of a representative space, at a height of 1.5 ... 1.6 meters from the floor, on an internal wall as far as possible from windows, doors and sources of heat; corners, shelving and curtains must be avoided.

8.5 Boiler anticondensing detector B4

Can be used only if the boiler is fitted with an anticondensing pump and must be installed on the return pipe of the boiler between the anticondensing pump connection and the boiler itself.

8.6 DHW temperature detector B5

This must be installed on the DHW tank, preferably on the lower part (1/3 height) using cable-type detectors for deep pockets.

9. WIRING

Proceed as follows :

- Separate base and cover
- Mount base on DIN rail and check that securing elements (5.4) hold it firmly in place.
- Carry out wiring according to the diagram and in observance of the relevant regulations in force, and using cables of :
 - 1,5 mm² for power and relay control outputs
 - 1 mm² for detectors and remote control
 - 1 mm² for C-Ring. For wire length limits please see technical data sheets T 021 and T 022.
- Switch on power (230 V~) and check voltage across terminals L and N.
- Switch off power, replace cover on base and secure it with the four screws supplied (5.3).

You are advised not to insert more than two cables in a single terminal of the controller and if necessary to use external junction boxes.

10. EXAMPLES OF INSTALLATIONS

10.1 Compensated control of heating zone by control valve, with DHW at constant value

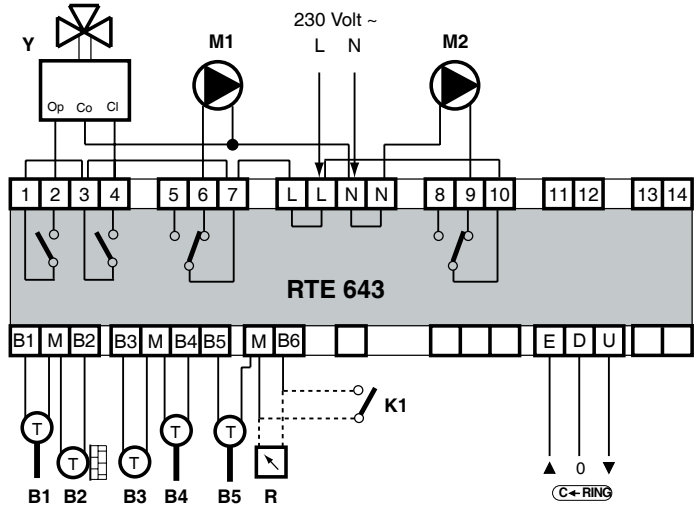
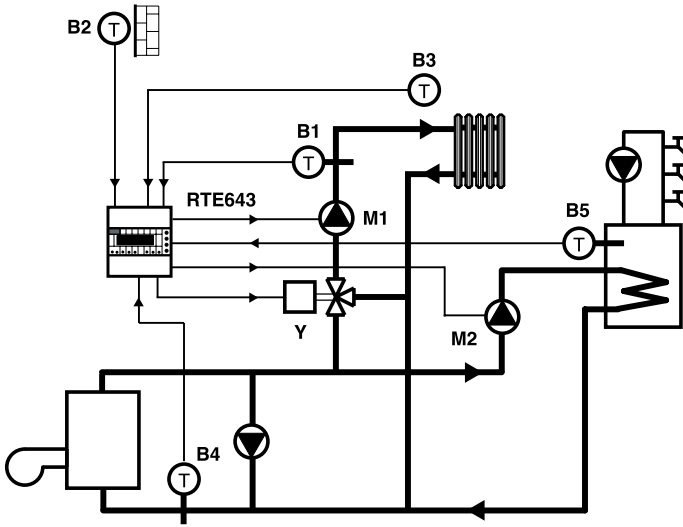
22.6

23.1

Configuration

Control: VALVE
Time: 630 sec

Auxiliary output
ON-OFF CONTROL



- B1 – Plant flow temp. detector
- B2 – Outside temp. detector
- B3 – Ambient temp. detector
- B4 – Anticondensing temp. detector
- B5 – DHW temp. detector
- K1 – External switch for "REMOTE OFF"
- L – Line 230 V~

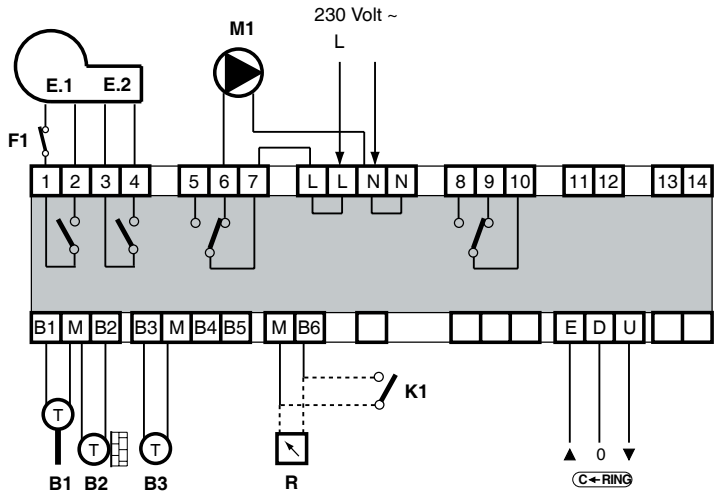
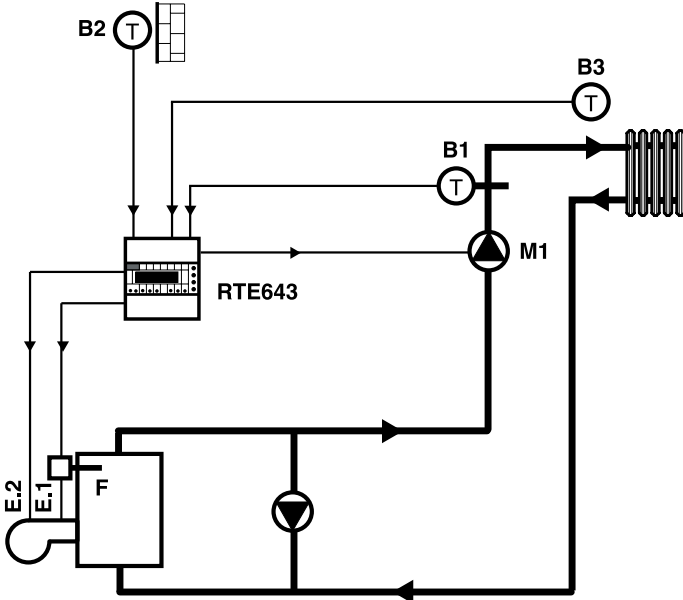
- N – Neutral
- M1 – Heating pump
- M2 – DHW pump
- R – Remote control for modifying programmes
- Y – Motorised valve for heating
- C-Ring – Data transmission between controllers

10.2 Compensated control of heating zone by control two-stage burner

22.6

Configuration

Control: ON-OFF
Different.: 10.0c



- B1 – Plant flow temp. detector
- B2 – Outside temp. detector
- B3 – Ambient temp. detector
- E.1 – 1st stage
- E.2 – 1nd stage
- F – Boiler thermostat

- K1 – External switch for "REMOTE OFF"
- L – Line 230 V~
- N – Neutral
- M1 – Heating pump
- R – Remote control for modifying programmes
- C-Ring – Data transmission between controllers

11. COMMUNICATION

11.1 C-Ring communication between controllers (for detailed information please see data sheet T 022)

RTE 643 controller can be “**Primary**” or “**Secondary**”.

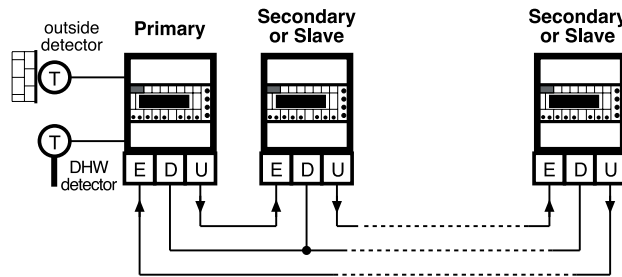
In C-Ring the following signals are transmitted:

- permission for **Slave** controllers to operate
- value of **outside temperature** (use of single detector for several controllers)
- value of **flow temperature** requested by several controllers; used by “PRIMARY” controller for control of temperature boilers (if scheduled)
- **DHW priority** and/ or **anticondensing** = closure valves heating zones by modulating control action.

24.1
CRing Connection:
NO

NO = no connection to C-Ring
 PRIMARY = connection to C-Ring as "Primary" controller
 SECONDARY = connection to C-Ring as "Secondary" controller

11.2 C-Ring wiring diagram



12. OPERATION

RTE 643 is a digital controller with microprocessor for :

- compensated control, with or without ambient authority, of a heating zone. Three-wire control of a motorised valve or On-Off of single- or two-stage burners and On-Off of circulation pump.
- control of temperature at fixed point (or a timed events programme) of a secondary circuit (eg DHW). On-Off control of a plant component.
- the acquisition of status and/or alarms regarding plant components.

To configure the controller please see sections “Sequence of display pages”

13. HEATING ZONE

13.1 Heat emitters

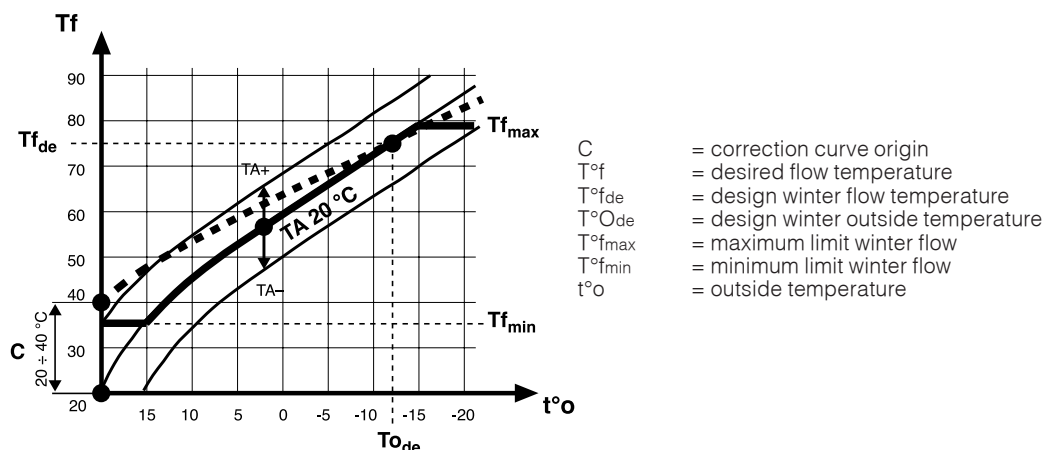
22.1
Heat Emitters
RADIATORS

The controller must be configured according to type of heat emitters used:

- Type heat emitters : RADIATORS
 PANELS
 FAN COILS

13.2 Heating curve

The flow temperature requested by the controller (detector B1) is adjusted in relation to the outside temperature (detector B2 or value transmitted via C-Ring) and by the heating control curve. The controller compares the actual value of the flow temperature with that corresponding to the curve and, in the event of a difference, regulates with PI control action (pre-set proportional band P_b and integral time I_t) the motorised valve to eliminate it.



The heating control curve, having reference to a desired ambient temperature of 20°, is established by:

22.2

**Design Outside
Temp :** - 5.0c

22.3

**Design Flow
Temp :** 70.0c

- design outside temperature : used for calculation of winter heat losses from building, depends on the climatic zone in which building situated.
- design flow temperature: used for determining thermal requirements of heating zone (eg: radiators = 70 °C , fan coils = 80 °C ; panels = 40 °C).
- heating curve origin : winter flow temperature with outside temperature of 20 °C

The flow temperature required by controller depends also on value of ambient temperature required by operating mode: Normal, Setback, Frostprot (parallel ± adjustment of the curve).

13.3 Heating curve origin

22.4

**Curve Origin TO20
Flow T:** 20.0c

The conventional point of origin of the heating curve (+ 20 °C flow at 20 °C outside temp.) can be adjusted by an increase in the flow temperature (max + 20 °C).
The adjustment may be necessary to avoid possible imbalances in the output of the heat emitters with high outside temperatures (intermediate seasons).

13.4 Operating temperatures

RTE 643 permits configuring, with different desired temperature values, the various operating modes available, in particular:

20.1

**Desired Temp
NORMAL** 20.0c

– NORMAL = operation with compensated control to provide comfortable ambient temperatures (daytime or when building occupied)

20.2

**Desired Temp
SETBACK** 16.0c

– SETBACK = operation with compensated control to provide economical ambient temperatures (at night or when building unoccupied)

20.3

**Desired Temp
FROSTPROT** 6.0c

– FROSTPROT = operation with control providing safety temperature (holidays or when building unoccupied)

– OFF = valve closed and pump idle

13.5 Minimum and maximum flow temperature limits

22.5

**Flow T Limits
Min:1c Max:99c**

RTE 643 permits configuring, with different desired temperature values, the various operating modes available, in particular:

When the desired flow temperature reaches one of its limit values it is kept constant at that value.

- eg:
- minimum limit to avoid circulation of cold air in fan coils
 - maximum limit to avoid dangerous overtemperatures in panels

Warning: The maximum limit temperature does not substitute the requirements of the safety regulations in force.

13.6 Type of control

22.6

**Control VALVE
Time :** 630 sec

Choice of type of control for heating zone :

- Control : VALVE = control valve with three-wire actuator
Time : sec = time of complete run (open/closed) of valve actuator, **necessary** for correct operation of controller.

or :

**Control : ON-OFF
Different:10.0c**

- Control : ON-OFF = On-Off control in two stages
Different : c = temperature differential for On-Off in two stages

22.7

**Minimum Start
Time :** 60sec

If in **Control : ON-OFF
Different : 10.0c** choice is On-Off, to ensure that switching the components controlled (eg: burner) on and off for too short periods not bring about lockouts set minimum start and stop times.

22.8

**Minimum Stop
Time :** 60sec

13.6 Ambient authority

22.9

**Ambient Authority
on flow: - - - - c**

Appears when ambient detector B3 is connected. The controller is able to correct the desired flow temperature according to the ambient authority set.

- Ambient authority on flow = value in °C of adjustment (increase/decrease) of flow temperature for each degree of difference in ambient temperature in opposite direction.

13.8 Eco Off

20.6

Eco Off
NO

Permits excluding heating when weather conditions do not require it:
 - NO = disabled
 - YES = enabled only for heating (valve closed and pump idle)
 Functions only in Normal/Setback modes for :

To ≥ T_{ad} = Eco Off : On

To < T_{ad} - 1°C = Eco Off : Off

where : T_o = actual outside temperature
 T_{a_d} = desired ambient temperature

13.9 Operating programmes

19.2

Htg : -----
24HOUR 1

Choice of operating programme for heating zone according to requirements :
 - 24HOUR 1 ... 7; 7DAY 1-2; NORMAL ; SETBACK; FROSTPROT; OFF.

In place of programme the following may appear:

- REMOTE NORMAL = external remote control "R" is in "Normal" position
- REMOTE SETBACK = external remote control "R" is in "Setback" position
- REMOTE FROSTPROT = external remote control "R" is in "Frostprot" position
- REMOTE OFF = external remote control "R" is in "Off" position or switch K1 is closed
- REMOTE + 2c = external remote control "R" is in "TAd+ 2°C" position.

13.11 Operating mode and adjustment of temperature

19.2

Htg : -----
24HOUR 1

The current mode depends on the programme set in the display :

- NORMAL Td - . - c
- SETBACK Td - . - c
- FROSTPROT Td - . - c
- OFF
- ECO OFF

- Var + = adjustment of ± 3 °C; possible in operating modes NORMAL and SETBACK.

13.10 Modifying programmes by remote control

19.3

Mode : NORMAL
Td20.Oc Var+0.0c

There are two options for changing the current operating programme :

- a) Using remote control R (CDB300) - see wiring diagram - which permits following choices :
 - OFF : plant excluded
 - FROSTPROT : continuous operation at desired Frostprot ambient temperature
 - NORMAL : continuous operation at desired Normal ambient temperature
 - SETBACK : continuous operation at desired Setback ambient temperature
 - TAd + 2c : increase of 2 °C in temp. desired by current mode.
 - AUTOMATIC : operation with chosen programme.
- b) Using external switch K1 (see wiring diagram) which permits two choices:
 - OPEN : operation with chosen programme for controller.
 - CLOSED : plant excluded (REMOTE OFF).

13.12 Control plant pump

22.10

Heating Pump
Delay Off: 2min

The heating zone pump can be controlled in two ways:

- MAN = Pump in continuous operation (always On)
- AUT = Pump M1 controlled according to current mode :
 - Off : pump always Off
 - Eco Off : pump always Off
 - Normal : pump always On
 - Setback & Frostprot :
 - a) with detector B3 installed: pump Off after delay switching off. Pump On when actual ambient temp. is below calculated flow temperature.
 - b) with ambient detector B3 not connected : pump always On
- Delay Off : 2 min = Delay in switching off to dissipate heat accumulated in plant.

14. CONTROL AUXILIARY CIRCUIT (DHW)

The auxiliary output can be configured for use as:

- ON - OFF CONTROL = control of auxiliary circuit with control pump M2 according to times of chosen programme and desired temperature.
- TIMED CONTROL = control of pump M2 only in relation to times of chosen programme.

23.1

**Auxiliary output
ON-OFF CONTROL**

14.1 Desired temperature

20.4

**Desired Temp
DHW 50.0c**

Appears only if in **Auxiliary output ON-OFF CONTROL** ON - OFF CONTROL is entered.

Value of temperature desired for DHW storage. When DHW control switches on the M2 pump the controller sends in C-Ring the desired DHW temperature increased by the value set in

23.7

**IncreasesTCRing on
Des DHW T: 5.0c**

14.2 Differential

23.2

**Differential T
DHW 3.0c**

Appears only if in **Auxiliary output ON-OFF CONTROL** ON-OFF CONTROL is entered.

The differential is the temperature difference for control of auxiliary circuit pump M2.

14.3 Operating programmes

19.4

**Prod DHW
ALWAYS ON**

Choice of operating programme for auxiliary (DHW) circuit :

- 24HOUR 1...7; - 7DAY 1 - 2, - ALWAYS ON; - ALWAYS OFF;

14.4 Operating modes

DHW control uses one of programmes available for controller.

Note carefully that when a 24-hour programme is prepared specially for DHW the available operating modes have the following significances:

- NORMAL ; SETBACK ; = ON (On) = Desired DHW T
- FROSTPROT; OFF =OFF (Off) = Desired DHW T

20.4

**Desired Temp
DHW 50.0c**

20.3

**Desired Temp
FROSTPROT 6.0c**

14.5 Delay switching off pump

23.3

**Delay pump Off
DHW :NO**

Appears only if in **Auxiliary output ON-OFF CONTROL** ON-OFF CONTROL is entered.

Delay in switching off DHW pump when desired temperature reached :

- NO = no delay
- YES = delay of 5 minutes (fixed) in switching off.

14.6 Antibacteria function

23.4

**Antibacteria
DHW :NO**

Antibacteria = increase in DHW temperature to 70 °C for 90 minutes every Wednesday at 02:00 a.m. so as to avoid formation of bacteria inside storage tank.

- NO = function excluded
- YES = function enabled

14.7 Auxiliary circuit (DHW) priority

23.5

**DHW
priority :NO**

23.6

**Name Auxiliary
DHW**

Appears only if in **Auxiliary output ON-OFF CONTROL** ON-OFF CONTROL is entered.

- NO = function excluded
- YES = When temperature of auxiliary circuit (measured by detector B5) falls below value required by controller, if pump switched on, heating valve closed by modulating action.

14.8 Denomination of auxiliary circuit

Entering of name of auxiliary circuit which appears on all relevant display pages.

Using + and - keys, each dash can be replaced by a letter of the alphabet (A ... Z) or by a digit (0 ... 9). The ← and → keys, serve to position the cursor.

15. PROGRAMMES & PERIODS WITH DATES

All programmes with timed events can be used both for compensated control and for DHW control.

15.1 24-hour programmes

21.1

How many 24hour programmes ? 1

21.2

P1 Event 1 06.00
NORMAL 21.0c



21.7

P1 Event 6 22.00
SETBACK 16.0c

Enter the number of 24-hour programmes you wish to use (from 1 to 7).

In each 24-hour programme (P1 ... P7) you can set a maximum of six event start times (Event 1 ... Event 6) assigning to each one of following modes :

- NORMAL = compensated control with NORMAL ambient temperature
- SETBACK = compensated control with SETBACK ambient temp.
- FROSTPROT = compensated control with FROSTPROT ambient temp.
- OFF = plant Off, valve closed and pump idle.

The event start times must be entered in increasing order.

Events not used must be excluded by pressing + and - keys at the same time. Unused times must not be left between programmed events.

15.2 7-day programmes

21.8

How many 7day Programmes ? 0

21.9

7day 1 MONDAY
24HOUR 1



21.15

7day 1 SUNDAY
24HOUR 1

Enter number of programmes you wish to use (max 2).

In each 7-day programme you can assign to each day of the week one of following programmes:

- 24HOUR 1 ... 7;
- NORMAL;
- SETBACK;
- FROSTPROT;
- OFF.

15.3 BST

21.16

SummerTime
Fr : 29.03 to : 26.10

The controller changes automatically the current time according to the GMT/BSTperiod.

- Fr - - - - = night of last Saturday of March clock automatically put forward one hour.
- to - - - - = night of last Saturday of October clock automatically put back one hour.

To cancel the period keep pressed + and - keys at same time.

16. COMPLEMENTARY FUNCTIONS

16.1 Anticondensing function

20.5

Anticondens : NO
Desired T : 50.0c

Choice of enabling or not anticondensing function:

- NO = function excluded
- YES = When return to boiler temperature (measured by detector B4) falls below desired anticondensing temperature the controller, if pump is switched on, closes DHW circuit valve by modulating action.

• Desired T : - - - - c = value of anticondensing temperature.

16.2 Access keynumber

24.2

Choice Keynumber
- - - -

Access Keynumber
- - - -

Choice and enabling of access keynumber which prevents use of + and - keys for modification of data. Enter the number (1900 ... 1999) using + and - keys.

To cancel keynumber, press + and - at same time until dashes reappear.

When keynumber is enabled, if + or - keys are pressed on the display appears the request to enter keynumber. Only after having entered the correct keynumber can + and - keys be used.

If for 15 minutes no key is pressed the keynumber is automatically reenabled.

16.3 Denomination of heating zone

22.11

NameHeatingPlant
- - - - -

Entering name of heating zone/DHW circuit which appears on first page of display.

Using + and - keys, each dash can be replaced by a letter of the alphabet (A ... Z) or by a digit (0 ... 9). The ← and → keys serve to position the cursor.

16.4 Display of measurements

19.6

Des Amb T: 21.0c
Act Amb T: 21.0c

19.7

Des Flow T: 65.0c
Act Flow T: 64.0c

19.8

Outside Temp
Actual :- 2.0c

19.9

Des AnticT: 50.0c
Act AnticT: 58.0c

19.10

DHW desird: 50.0c
DHW actual: 58.0c

The controller displays all the values measured by the detectors and the data necessary to monitor the operational status of the plant:

- **ambient temperature** desired by current mode and actual measured by detector B3. If detector B3 not connected in place of Act Amb T appears Cal Amb T - - - - c.
- **flow temperature** desired by current mode and actual measured by detector B1.
- **outside temperature** actual. If detector B2 not connected to controller, in place of Actual appears C-Ring and value is that coming via C-Ring.
- **anticondensing temperature** desired by current mode and actual measured by detector B4. If detector B4 not connected there appears Act AnticT: - - - - c.
- **DHW temperature** desired by current mode and actual measured by detector B5. If detector B5 not connected there appears Act DHW: - - - - c.

16.5 Signalling alarm situations

- The controller processes three alarms for faulty operation:
- real time clock alarm = indicated by a LED on the facia (fig.6.7) warns that the internal real time clock is faulty.
 - C-Ring alarm = indicated by a LED on the facia (fig.6.8) warns of a break in the C-Ring.
 - fault alarm = indicated by a LED on the facia (fig.6.9) warns that controller microprocessor is faulty.

17. TESTING AT COMMISSIONING

Testing to be carried out when installation concluded and wiring and configuration completed and checked.

17.1 Testing C-Ring

25.1

CRing: ??

The C-Ring testing page appears only if controller is configured as PRIMARY or SECONDARY in

24.1

CRing Connection
PRIMARY

Ensure that all the other controllers connected in C-Ring are:

- correctly powered by 230 V ~
- Slave controllers or configured as SECONDARIES in CRing Connection
SECONDARY
- selected on testing page CRing: ??

25.2

Output: VALVE
Status: CLOSES

The PRIMARY controller sends a signal every five seconds via C-Ring. On all the displays appears ???. If wiring is correct, OK replaces ??? on all the displays. If on one or more displays OK does not appear, this indicates that there is a wiring or controller fault between the last controller with OK and the first with ???.

- Examples of testing a C-Ring setup with four controllers:
- | | | | | |
|--------------|--------------|--------------|--------------|-------------------------|
| - Cont. 1 OK | - Cont. 2 OK | - Cont. 3 OK | - Cont. 4 OK | : C-Ring OK |
| - Cont. 1 ?? | - Cont. 2 OK | - Cont. 3 OK | - Cont. 4 OK | : Fault between 4 and 1 |
| - Cont. 1 ?? | - Cont. 2 OK | - Cont. 3 ?? | - Cont. 4 ?? | : Fault between 2 and 3 |
| - Cont. 1 ?? | - Cont. 2 ?? | - Cont. 3 ?? | - Cont. 4 ?? | : Fault between 1 and 2 |

17.2 Testing outputs

- With + and - keys choose :
- Output to be tested :
 - VALVE ;
 - PUMP ;
 - AUXILIARY;
 - status :
 - with VALVE: IDLE; CLOSES; OPENS
 - with PUMP, AUXILIARY : ON or OFF

Check the results.

18. SEQUENCE OF DISPLAY PAGES (the data and functions are those in memory at time of delivery)



- ← → Keys for scrolling the display pages and positioning the cursor █ on data which can be modified on these pages. The modifiable data in the following descriptive list of display pages are highlighted thus █. By pressing these keys at the same time for a few seconds, or in any event after 15 minutes the first page returns to the display

Htg: -----
12.18 MONDAY
- ⊖ ⊕ Keys for: - changing the values highlighted by the cursor █
- displaying the configuration options of a function eg: Type of plant FAN-COIL or Type of plant PANELS
- passing directly from one menu (series of pages) to another.

19. NORMAL USE				
Ref.	Display	Description	Notes	Cap.
19.1	Htg:----- 12.18 MONDAY	Name plant Current time and day	Entered in 22.11 Entered in 19.5	
19.2	Htg:----- 24HOUR 1	Choice programme : 7DAY 1-2; 24HOUR 1...7; NORMAL; SETBACK; FROSTPROT; OFF.	Instead of programme may appear. REMOTE NORMAL; REMOTE SETBACK; REMOTE FROSTPROT; REMOTE OFF; REMOTE + 2C	13.9
19.3	Mode :Normal Td21.0c Var±0.0c	Current mode Td : Temperature required by mode Var : Desired temp. variation (max ± 3 °C)	Current modes : NORMAL; SETBACK; FROSTPROT; OFF; ECO OFF.	13.10
19.4	Prog DHW ALWAYS ON	Choice programme auxiliary (DHW) circuit: 7DAY 1-2; 24HOUR 1 ... 7; ALWAYS ON; ALWAYS OFF:		14.3
19.5	12.18 MONDAY 10.02.96 GMT	Setting : Time, day of week and date Current time period: GMT or BST	Date BST entered in 21.16 .	
19.6	Des Amb T:80.0c Act Amb T:80.0c	Ambient temp. required by current mode. Temp. measured by flow detector B3.		16.4
19.7	Des Flow T:80.0c Act Flow T:80.0c	Flow temp. required by current mode. Temp. measured by flow detector B1.		16.4
19.8	Outside Temp Actual -02.0c	Actual outside temp. measured by B2 or coming via C-Ring	If outside detector B2 not connected and value comes via C-Ring, Actual replaced by C-Ring	
19.9	Des AnticT:50.0c Act AnticT:58.0c	Desired anticondensing temperature. Temp.measured by flow detector B4.		16.4
19.10	DHW D :60.0c DHW A :58.0c	Desired boiler temperature Temp. measured by flow detector B5.	Appears only if in 23.1 ON-OFF CONTROL se- lected	
19.11	RTE 643 Eng. C2 Vers. xx	Identifying data of controller.		

20. TEMPERATURES & CONTROLS

Ref.	Display	Description	Notes	Cap.
20.1	Desired Temp NORMAL 20.0c	Value of desired NORMAL ambient temp. to be used in 24-hour programmes in 21.2 .		13.4
20.2	Desired Temp SETBACK 16.0c	Value of desired SETBACK ambient temp. to be used in 24-hour programmes in 21.2 .		13.4
20.3	Desired Temp FROSTPROT 6.0c	Value of desired FROSTPROT ambient temp. to be used in 24-hour programmes in 21.2 .		13.4
20.4	Desired Temp DHW 50.0c	Value of desired DHW temperature	Appears only if in 23.1 ON - OFF CONTROL se- lected.	14.1
20.5	Anticondens : NO Desired T : 50.0c	Enabling of anticondensing function: NO; YES. Setting value of anticondensing temperature.	NO: function excluded YES: if return to boiler temp. (B4) falls below value of desired anticondensing temp. , controller closes heating valve by modulating action.	16.1
20.6	Eco Off NO	Eco Off function: NO; YES.	In Normal or Setback modes : • Eco Off : On = actual outside temp. ≥ desired ambient temp., valve closed & heating pump off. • Eco Off : Off = actual outside temp. < desired ambient temp.	13.8

21. EVENTS & PERIODS

Rif.	Display	Description	Note	Cap.
21.1	How many 24hour Programmes ? 1 P1 Event 1 06.00 NORMAL 20.0c P1 Event 6 22.00 SETBACK 16.0c	Choice of number of 24-hour programmes to be used (1...7). Number of programme, number of event & time of start period in programme. Choice of type of mode to assign to period : NORMAL; SETBACK; FRO- STPROT; OFF. Further groups of 6 pages according number entered in 21.1	Avoids scrolling unnecessary display pages. Max 6 periods. To eliminate an unused period press + and - together; ---- appears. The events must be in increasing order. You must not leave ---- between programmed events.	15.1
21.8	How many 7day Programmes ? 0	Choice of number of 7-day programmes to be used (1-2)	Avoids scrolling unnecessary display pages.	15.2
21.9 ↓ ↓	7day 1 MONDAY 24HOUR 1	Choice of programme for each day of week: 24HOUR 1 ... 7; NORMAL; SETBACK; FROSTPROT; OFF.	Appears only if in 21.8 number greater than 0.	15.2
21.15	7day 1 SUNDAY 24HOUR 1			
21.16	GMT Fr:29.03 to:26.10	Dates of start and end of BST period.		15.3

22. SETTING HEATING				
Ref.	Display	Description	Notes	Sect.
22.1	Heat Emitters RADIATORS	Choice of heat emitters: RADIATORS; PANELS; FAN COILS.		13.1
22.2	Design Outside Temp : -05.0c	Value of design outside temp. for compensated control.		
22.3	Design Flow Temp : 70.0c	Value of design flow temp. for compensated control		13.2
22.4	CurveOrigin T020 FlowT: 20.0c	Correction of heating curve origin.		13.3
22.5	Flow T Limits Min: 1c Max: 99c	Value of minimum & maximum limits of flow temperature		13.5
22.6	Control: VALVE Time : 630sec	Choice of type control: VALVE; ON-OFF. Run time of valve (if VALVE) or Differential (if ON- OFF).	VALVE = three-wire modulating control ON-OFF = On-Off control in 1 or 2 stages.	13.6
22.7	Minum Start Time : 60sec	Minimum duration switching on burners	Appears only if in 22.6 ON-OFF entered.	13.6
22.8	Minimum Stop Minimo : 60sec	Minimum duration switching off burners	Appears only if in 22.6 ON - OFF entered.	13.6
22.9	AmbientAuthority on Flow : ----	Ambient authority. Variation ± °C in flow temp. with ± 1°C difference ambient temp.	Appears only if ambient detector B3 connected.	13.7
22.10	Heating Pump: AUT Delay Off: 30min	Control of plant pump: MAN; AUT. Delay switching off pump.	MAN: always on; AUT: On according current programme events.	13.12
22.11	NameHeatingPlant -----	Entering plant name	Use + and – to enter letters or digits. Use ← and → to position cursor.	16.3
23. SETTING AUXILIARY CIRCUIT				
Rif.	Display	Description	Notes	Cap.
23.1	Auxiliary output ON-OFF CONTROL	Choice of type of use for auxiliary output: ON - OFF; TIMED CONTROL;	ON - OFF CONTROL = On-Off control of auxiliary circuit according desired temperature and programmed events. TIMED CONTROL= control auxiliary output by timed events.	14.
23.2	Differential T DHW 3.0c	Value of differential control pump	Appears only if in 23.1 ON-OFF CONTROL entered	14.2
23.3	Delay pump Off DHW : NO	Delay switching off pump	Appears only if in 23.1 ON-OFF CONTROL entered NO: without delay YES: 5 minutes delay	14.5
23.4	Antibacteria DHW : NO	Enabling antibacteria function: NO; YES.	Appears only if in 23.1 ON-OFF CONTROL entered NO: antibacteria function excluded YES: every Wednesday at 12 noon DHW temp. increased to 70 °C.	14.6
23.5	AUX priority : NO	Enabling auxiliary control priority: NO; YES.	Appears only if in 23.1 ON-OFF CONTROL. NO: priority function excluded YES: priority function enabled.	14.7
23.6	Name Auxiliary DHW	Entering name of auxiliary circuit. Appears on all display pages regarding auxiliary circuit.	Use + and – to enter letters or digits. Use ← and → to position cursor.	14.8
23.7	IncreaseTCRing on Des DHW T: 5.0c	Increase in desired DHW temperature to obtain the temperature sent in C-Ring when in operation the DHW pump M2 (range: 0...50 C°, resolution 0.5 C°).	Appears only if in 27.3 is not NO.	14.8
24. CONFIGURAZION RTE 643				
Rif.	Display	Description	Notes	Cap.
24.1	CRing Connection NO	NO : Not connected in C-Ring. PRIMARY: Configured as Primary. SECONDARY : Configured as Secondary.		11.1
24.2	Choice Keynumber ----	Choice keynumber for preventing use + and – keys. – 1901 ... 1999	To eliminate keynumber press + and – together.	16.2

25. TESTING				
Ref.	Display	Description	Notes	Sect.
25.1	CRing: ??	Page of testing C-Ring connections. ?? = C-Ring test in progress or test failed YES= test OK	Appears only if in 24.1 PRIMARY or SECONDARY entered.	17.1
25.2	Output: VALVE Status: IDLE	Choice output to be tested Choice status of output	Choice output: VALVE ; PUMP ; AUXILIARY; Choice status: With VALVE : IDLE ; CLOSES ; OPENS With PUMP, AUXILIARY: ON - OFF.	17.2

Amendments to data sheet

Date	Revision No.	Page	Section	Details of amendments	Firmware software	Software software
09.10.07 LB	01	1 3-4	3. DETECTORS, REMOTE .. 7. WIRING DIAGRAM	Add new remote control CDB 300/S1 The numbers of the terminals shown in the actuators have been eliminated	≥ 03	≥ 0.98.2295
05.12.07 LB	02	3-4	7. WIRING DIAGRAM	Delete relay switches not used	≥ 03	≥ 0.98.2295
21.05.10 VM	03	8	14.6 Antibacteria function	Changed antibacteria function's time	≥ 03	≥ 0.98.2295



Head Office & Sales

Via San G.B. De La Salle, 4/a Tel. +39 022722121
20132 - Milano Fax +39 022593645
Orders Fax +39 0227221239
Reg. Off. Central & Southern

Via S. Longanesi, 14 Tel. +39 065573330
00146 - Roma Fax +39 065566517

Shipping

Via Gen. Treboldi, 190/192 Tel. +39 0364773200
25048 - Edolo (BS) Tel. +39 0364773202

E-mail: info@coster.info Web: www.coster.eu



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